U P S

Uninterruptible Power System

Line Interactive Network Protection
Pure Sine Wave Output UPS

Regular models600A/800A/1000A/1250A
1500A/2000A/2500A/3000A
&
Extended Run-Time Models
1000AL/2000AL/3000AL

USER'S MANUAL

Printed in USA
A

Important safety instructions

Thank you for selecting this uninterruptible power system (UPS). It provides you with better protection for connected equipment.

Please read this manual!

This manual provides safety, installation and operating instructions that will help you derive the fullest performance and service life that the UPS has to offer.

Please save this manual!

It includes important instructions for the safe use of this UPS and for obtaining factory service should the proper operation of the UPS come into question.

Please save or recycle the packaging materials!

The UPS‘ s shipping materials were designing with great care to provide protection from transportation related damage. These materials are invaluable if you ever have to return the UPS for service. Damage sustained during transit is not covered under the warranty.

Table of contents

1. Introduction 4
2. Safety 5
3. Presentation 6
   Front Panel
   Rear Panel
   Output
4. Installation 12
5. Operation 14
6. Alarms 15
7. Software Options 16
8. Maintenance 16
9. Computer Interface Port 17
10. Battery replacement 18
11. Storage 18
12. Troubleshooting 19
13. Battery Pack Installation 20
14. Specifications 21

66M-K800-011

66M-K800-012

1. INTRODUCTION

The product is line interactive UPS with the newest technology and powerful function. The LINE INTERACTIVE UPS is with AVR function allows input voltage range from 75% to 125%, including on line voltage boost-up & buck down. An ideal protection equipment for critical connected loads. It is based on microprocessor controls, with utility power connected, the charging is ongoing, no need to switch ON the UPS and at back-up mode, UPS can be automatically turned OFF if none of the connected loads is operating to save the battery energy. The indicator will be ON when battery needs replacement and a cyclic self-testing function is included in order to verify both the operation of the UPS and the condition of the battery.

In addition, This UPS provides advanced single telephone line or modem surge suppression through the modular connectors on the back panel.

The LINE INTERACTIVE UPS and RUPS seies monitoring software (optional kits) makes your computer operate intelligent and provides you with the ability of perfect protection of your critical devices.

Note: There is no guarantee that interference to radio/TV will not occur in a particular installation. If this UPS causes interference to radio or television reception, which can be determined by turning the UPS off and on, the user is encouraged to try to correct the interference by one or more of following measures:

connect the equipment to an outlet on a circuit different from that to which the receiver is connected

increase the separation between the equipment and the receiver

reorient the receiving antenna

2. Safety

CAUTION !

⋁ ***To reduce the risk of electric shock, disconnect the UPS from the mains supply before installing a computer interface signal cable. Reconnect the power cord only after signaling interconnections have been made.***

⋁ ***The internal energy source(the battery) cannot be de-energized by the user. The output may be energized when the unit is not connected to a mains supply.***

⋁ ***The right way to de-energize the UPS properly in an emergency is to move the I/O switch to the OFF position and disconnect the power cord from the mains supply.***

⋁ ***The socket-outlet shall be installed near the equipment and easily accessible.***

⋁ ***Attention, hazardous through electric shock. Also with disconnection of this unit the main, hazardous voltage still may be accessible through supply from battery. The battery supply should be therefore disconnected in the plus and minus pole when maintenance of service work inside the UPS is considered.***

⋁ ***Do not dispose of batteries in a fire, the battery may explore.***

⋁ ***Do not open or mutilate the battery, released electrolyte is harmful to the skin and eyes.***

⋁ ***A battery can present a risk of electric shock and high short circuit current. The following precaution should be observed when working on batteries***
- Remove watches, rings or other metal objects.
- Use tools with insulated handles.

Caution: Risk of electric shock - hazardous live parts inside this unit are energized from the battery supply even when the input AC power is connected.

Caution: Risk of electric shock, do not remove cover. No user serviceable parts inside, Refer servicing to qualified service personnel.

Warning: To reduce the risk of fire, replace only with the same type and rating of fuse.

Warning: To reduce the risk of fire or electric shock, install in temperature and humidity controlled indoor area of conductive contaminants.

3. Presentation

FRONT PANEL

3.1 "ON/TEST" button
With the UPS plugged in, press the ON/TEST button to turn on the UPS and

power the loads. ON/TEST also activates the UPS's self-test and utility line voltage displays.

3.2 " OVERLOAD" indicator (RED LED)
The LED lights when the loads connected to the UPS exceed the UPS's capacity. See Section 6.3.

3.3 "BACK UP" indicator (GREEN LED)
The LED illuminates when the UPS is supplying battery power to the loads.

3.4 "REPLACE BATTERY" indicator (RED LED)

The LED illuminates when the UPS's battery is no longer useful and must be replaced. See section 9.

Note: When replace battery, disconnect the utility power then open the case and take notice of the battery's polarity while install the new battery to avoid short. See section 9.

3.5 "BUCK AVR (VOLTAGE REDUCTION)" indicator (YELLOW LED)
The LED illuminates when the UPS is correcting a high utility voltage condition. The loads receive normal power.

3.6 "LINE NORMAL" indicator (GREEN LED)
The LED illuminates when the line input voltage is normal.

3.7 "BOOST AVR (VOLTAGE BOOST)" indicator (YELLOW LED)
The LED illuminates when the UPS is correcting a low utility voltage condition. The loads receive normal power.

3.8 LOAD bar graph
The display shows the power being drawn by the load.

3.9 POWER bar graph (BATTERY CHARGE/LINE VOLTAGE)
The display shows the present battery charge as a percentage of battery capacity. It also display the voltage of utility line.

3.10 "OFF" button
Press the OFF button to turn off the UPS and the loads.

REAR PANEL

3.11 TEL./MODEM SURGE PROTECTION
Surge protection for telephone and modem line to have the complete safety connection for INTERNET service.

3.12 EXTERNAL BATTERY PACK CONNECTOR (optional)
Caution: Use only factory supplied or authorized connecting cable for external

battery !

3.13 SNMP INTERFACE PORT (optional)
Provide the SNMP adapters for 10-BaseT Ethernet and Token Ring connectors. Through RS232 communication port, the SNMP adapter make your UPS becomes "SNMP manageable", provide a real time UPS and power status information for the network manager.

Note: It's not necessary to use this function.
Caution: Use only factory supplied or authorized SNMP monitoring cable !

3.14 OUTPUT POWER RECEPTACLES

3.15 AC INPUT POWER RECEPTACLE

3.16 INPUT CIRCUIT BREAKER
It trips when the connected loads exceed the protected receptacle's capacity, The center plungers of the circuit breakers extend when tripped.

3.17 SITE WIRING FAULT INDICATORS (RED LED)
It comes on when the UPS is connected to an improperly wired AC power outlet.
Note: This device is available on 110 Vac model only.

3.18 COMPUTER INTERFACE
Provide both RS-232 and relay signal to support NOVELL, UNIX, DOS, WINDOWS and other operating systems.

4. Installation

4.0 Inspection
Inspect the UPS upon receipt. The packaging is recyclable; save it for reuse or dispose of it properly.

4.1 Placement
Install the UPS in a protected area with adequate air flow and free of excessive dust. Do not operate the UPS where the temperature and humidity is outside the specified limits.

4.2 Connect Computer Interface (optional)

RUPS series software (or other power management software) and an interface kits can be used with this UPS. Use only kits supplied or approved by the manufacturer. If used, connect the interface cable to the 9 pin computer interface port on the back panel of the UPS.

Note: Computer interface connection is optional. The UPS works properly without a computer interface connection.
Caution: Use only factory supplied or authorized UPS monitoring cable !

4.3 Connect external battery pack (optional)
Before connecting, make sure the external battery pack and the connector cable are compatible with this UPS.

Note: External battery connection is not necessary. The UPS works properly without a external battery pack connection.
Caution: Use only factory supplied or external battery connection cable !

4.4 Connect the telephone/modem lines
Connect a single line telephone or a modem line into the telephone/modem surge protection sockets on the back of the UPS. The RJ-45/RJ-11 modular sockets accept standard single line telephone connections. This connection will require another length of telephone cable (supplied).

Note: This connection is optional. It is not necessary to use this UPS.

Caution: The telephone line current limiting feature could be rendered inoperable if improperly installed. Make sure that the telephone line from the wall is plugged into the connector marked "IN", and the device to be protected (telephone, modem, etc.) is plugged into the connector marked "OUT".

Caution: This surge protection device is for indoor use only and never install telephone wiring during a lightning storm.

4.5 Connect to Utility
Connect the AC input power connector to utility power to power up the UPS.

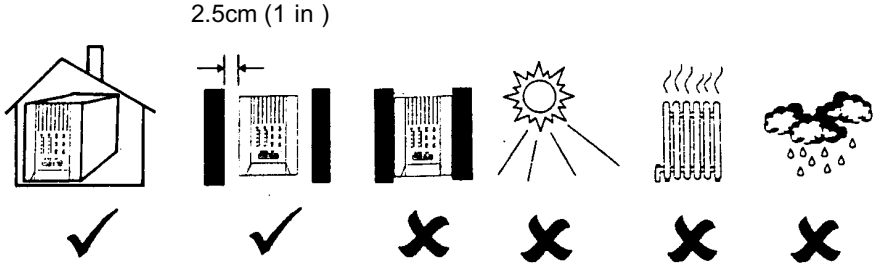
4.6 Charge the battery
The UPS charges its battery whenever it is connected to utility power. For best results, charge the battery for 4 hours in the initial use.

4.7 Connect the loads
Plug the loads into the output connectors on the rear of the UPS. To use the UPS as a master on/off switch, make sure all of the loads are switched on.

Caution: Never connect a laser printer or plotter to the UPS with other

computer equipment. A laser printer or plotter periodically draws significantly more power than when idle, and may overload the UPS.

4.8 Check the Site Wiring Fault Indicator
After plugging in the loads and the UPS, check the site wiring fault indicator on the rear panel. See section 3.17 for location of the indicator on the back panel. It lights if the UPS is plugged into an improperly wired AC power outlet. Wiring faults detected include ground, hot-neutral polarity reversal, and overloaded neutral circuit.



5. Operation

5.1 Switch on
With the UPS plugged in, press ON/TEST button less than 1 second to switch the UPS on. The UPS will perform self-testing each time when it is switched on.

Note: When switched off the UPS maintains the battery charge and will respond to commands received through the computer interface port.

5.2 Switch off
By pressing and holding OFF button until the "LINE NORMAL" or "BACK UP" LED off.

5.3 Self-test
Use the self-test to verify both the operation of the UPS and the condition of the battery. In normal utility power, push the ON/TEST button more than 1 second and UPS performs a self-test function. During the self-test, the UPS operates a back up mode.

Note: During the self-test, the UPS briefly operates the loads on-battery (the on-battery LED comes on).
If the UPS passes the self-test, it returns to on-line operation. The on-battery LED does off and the on-line LED goes on steady. If the UPS fails the self-test it immediately returns to on-line operation and lights the replace battery LED. The loads are not affected. Recharge the battery overnight and perform the self-test again. If the replace battery LED is still on, ask our nearest dealer to replace battery.

5.4 Silence
In "BACK UP" mode, push ON/TEST more than 1 second to silence the audible alarm. (The function is void when under condition of "LOW BATTERY" or "OVERLOAD")

Note: At back-up mode, UPS can be automatically turned off if none of the connected loads is operating.

5.5 Load bar graph
The 5-LED display (See section 3.8 for location of the indicator on the front panel) shows the power drawn from the UPS by load. The display indicates the percentage of the UPS's rated capacity. For example. If three LEDs are lit, the load is drawing between 50% and 67% of the UPS's capacity.
If the UPS is overloaded, the overload LED lights and alarm sounds. See section 6.3

5.6 Bttery charge bar graph
The 5-LED display (see section 3.9 for location of the indicator on the front panel) shows the present charge of the UPS's battery as a percentage of the battery capacity. When all five LEDs light, the battery is fully charged. When only two LED lights, the battery can supply less than two minutes of run time for the load.

5.7 Cold start
When the UPS is off and there is no utility power, use the cold start feature to apply power to the loads from UPS's battery. Press the ON/TEST button (see section 3.1 for location of the indicator on the front panel) until the UPS beeps.

5.8 Shutdown mode
In shutdown mode the UPS stops supplying power to the load, waiting for return of utility power. If there is no utility power present, external devices (e.g., servers) connected to the computer interface can command the UPS to shutdown. This is normally done to preserve battery capacity after the graceful shutdown of protected servers. The UPS will scroll the front panel indicators sequentially in shutdown mode.

6. Alarm

6.1 "BACK UP" (slow alarm)
When in BACK UP mode, the YELLOW LED illuminates and the UPS sounds an audible alarm. The alarm stops when the UPS returns to LINE NORMAL operation.
Press the ON/TEST button during on-battery alarms to stop the beeping.

6.2 "LOW BATTERY" (rapid alarm)
In BACK UP mode, when the battery energy runs low, the UPS beeps rapidly until the UPS shuts down from battery exhaustion or returns to LINE NORMAL operation.

6.3 "OVERLOAD" (continuous alarm)
When the UPS is overloaded (the connected loads exceed the maximum rated capacity) the UPS emits continuous alarm to warn a overload condition. Disconnect nonessential load equipment from UPS to eliminate the overload.

6.4 "REPLACE BATTERY" (continuous alarm)
The UPS emits continuous beeps and the REPLACE BATTERY LED illuminates if the battery fails the self-test. See section 9 to replace battery by yourself or call your dealer for services.

7. Software options

7.1 Power Monitoring Software
The RUPS series software (or other power monitoring software) is applied standard RS-232 interface to perform monitoring functions, and then provides an orderly shutdown of a computer in the event of power failure. Moreover, RUPS displays all the diagnostic symptoms on monitor, such as Voltage, Frequency, Battery level and so on..

The software is available for DOS, Windows 3.1x, Windows 95, Windows NT V3.5 or later, Novell Netware and others. Call your dealer for more information on computer OS compatible solutions.

7.2 Interface Kits
A series of interface kits is available for operation systems that provide UPS monitoring. Each interface kit includes the special interface cable required to convert status signals from the UPS into signals which individual operating system recognize. The interface cable at UPS side must be connected to REMOTE PORT , at computer side can be either COM 1 or COM 2. The other installation instructions and powerful features please refer to READ.ME file.

Caution: Use only factory supplied or authorized UPS monitoring cable !

8. Maintenance

1. Keep the unit clean and vacuum the ventilation intake periodically.
2. Wipe with soft loose and damp cloth.
3. Check for loose and bad connections monthly.
4. Never leave the unit on an uneven surface.
5. Position the unit to allow at least 10 cm clearance between the rear panel and the wall. Keep the ventilation intake open.
6. Avoid direct sunlight, rain. And high humidity.
7. Stay away from fire and extremely hot location.
8. Do not stack materials on top of the unit.
9. The unit should not be exposed to corrosive air.
10. The normal operating temperature is 0-40 .

9. Computer Interface Port

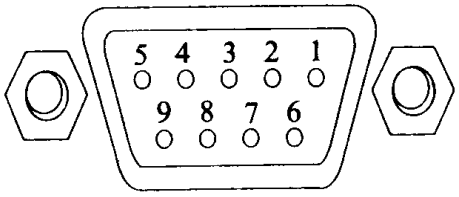
The computer interface port has the following characteristics:
The communication port on the back of the UPS may be connected to host computer. This port allows the computer to
monitor the status of the UPS and control the operation of the UPS in some cased. Its major functions normally include
some or all of the following:

- to broadcast a warning when power fails.
- to close any open file before the battery reserves are exhausted.
- to turn of the UPS.

Some computers are equipped with a special connector to link with the communication port. In addition, special plug-in
card may be needed. Some computers may need a special UPS monitoring software. Contact your dealer for the details on
the various interface Kits.
The computer interface port has the following characteristics:
1. Pin 5 and 2 are open collector outputs which must be pulled up to a common referenced supply no greater than +40 Vdc.
The transistors are capable of a maximum nonconductive load of 25 mAdc, Use only pin 7 as the common.

2. Pin 5 generates a High to Low signal when the battery inside the UPS has less than 5 minutes back up time left.
3. Pin 2 generates a High to Low signal when the line is fail.
4. The UPS will shut down when a high RS-232 level is sustained on pin 6 for 0.36 seconds.
5. Pin 9 is also the RS-232 data output.
6. Pin 6 is RS-232 data input (RxD)

NOTE:
1. Switch rating +40V, 0.15A non-inductive.
2. Pin 7 should be connected to ground only.



10. Battery Replacement

Your battery should run any where from 3-5 years before eve needing to be replaced.
Please follow the instructions below for easy battery replacement.
1) Unplug unit from AC power source and disconnect all connected equipment.
2) Disconnect AC power cord from unit..
3) Turn unit upside down and using a phillips screw driver, unscrew the 4 screws holding the top of the unit to the bottom. Put screws in a safe place for reconnection.
4) Holding the top together firmly with the bottom, turn the entire unit right side up.
5) Carefully lift top cover off and place to the side. The connecting wires and electronics will be exposed. Be careful not to touch any inner components when changing the battery.
6) Remove the 2 connecting wires from the battery.
7) You can now easily remove the battery from the unit
Caution: Do not dispose of battery in fire.
Caution: Do not attempt to open the battery.
Caution: The following precautions should be taken when replacing the battery
- ***remove watches, rings, etc…***
- ***use tools with insulated handles***

8) Place your new battery in the same position/direction and reconnect the wires red wire-position(+) and black wire negative(-)
9) Please follow steps 5,4 and 3 (in that order) to reconnect the entire unit.
10) Please follow manual instructions in order to properly reconnect your equipment.

11. Storage

10.1 Storage conditions
Store the UPS covered and upright in a cool , dry location, with its battery fully charged. Before storing, charger the UPS for at least 4 hours. Remove any accessories in the accessory slot and disconnect any cables connected to the computer interface port to avoid unnecessary draining the battery.

10.2 Extended storage
During extended storage in environments where the ambient temperature is -15 to +30 (+5 to +86), charge the UPS‘ s battery every 6 months.
During extended storage in environments where the ambient temperature is +30 to +45 (+86 to +113), charge the UPS‘ s battery every 3 months.

12. Troubleshooting

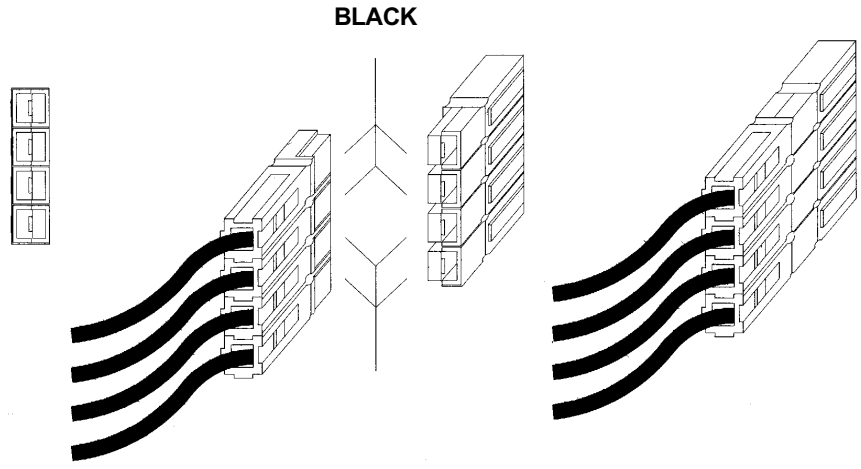
PROBLEM	POSSIBLE	ACTION TO TAKE
UPS will not turn on	On/test button not pushed or push too short	Press the on/test button to power the UPS and the load
	UPS input circuit break tripped	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker by pressing the plunger back in
	Very low or no utility voltage	Check the AC power supply to the UPS with multimeter
UPS will not turn on or off	Computer interface of accessory problem Push on/test or off button too short	Disconnect the computer interface or accessory. If the UPS now works normally, check the interface cable, the attached computer and the accessory
UPS operates on-battery even though normal line voltage is	UPS’ s input circuit breaker tripped	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker
UPS beeps occasionally	Normal UPS operation	Normal condition
UPS does not provide	The UPS’ s battery is	Charge the battery

	The UPS is overloaded	Check the UPS' s load display Remove nonessential equipments
Front panel indicators flash sequentially	The UPS has been shut down by remote control	None. The UPS will restart automatically when utility power returns.
All indicators are flash And the UPS emits a Constant tone	Internal UPS fault	Do not attempt to use the UPS. Turn the UPS off and have it service immediately
The UPS operates normally, but the site wiring fault indicator is lit.	Building wire error such as missing ground or hot to neutral wire reversal	Have a qualified electrician correct the building wiring
Low battery light is on and all LED is off.	The UPS is shut down and the battery is discharged and exhausted.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.
The replace battery light is lit	Weak batteries	The batteries to recharge for at least four hours If the problem still exists after recharging, replace with batteries.

13. Battery Pack Installation

Install up to 8 battery packs per xxxA(L) model UPS following the instruction below.

1 2 3



1. Prepare the UPS to connect the battery pack(s).
2. Note the hotes used to attach the battery pack connector clamp.
3. Insert the battery pack connector into the UPS.

To install additional batte **RED** procedure using the battery pack connectors on the battery packs.
Note: Do not stack battery packs.

14. Specifications

MODEL		SMK 600A	SMK 800A	SMK 1000A	SMK 1250A	SMK 1500A	SMK 2000A
INPUT	Capacity	600VA	800VA	1000VA	1250VA	1500VA	2000VA
	Voltage	100V, 110V, 120V, 220V, 230V, 240V, +/-25%,Single phase					
	Frequency	50 or 60Hz +/-5% (auto sensing)					
OUTPUT	Voltage (on battery)	Pure sine wave output at nominal +/-5%					
	Frequency (on battery)	50 or 60Hz +/-0.5%					
	Voltage Regulation AVR	AVR automatically increase output voltage 15% above input voltage if -9% to-25% of nominal. AVR decrease output voltage 15% below input voltage if+9% to +25% of nominal					
PROTECTION AND FILTERING	Spike Protection	320 Joules, 2ms					
	Unit Input	Fuse for overload & short circuit protection					
	EMI/RFI filter	10dB at 0.15MHz, 50dB at 30MHz					
	Overload Protection	UPS automatic shutdown if overload exceeds 110% of nominal at 20 second and 125% at 2 seconds.					
	Transfer Time	2/4 milliseconds, including detection time					
	Short Circuit	UPS output cut off immediately or input fuse protection					
BATTERY	Type	Hot swappable, Sealed, Maintenance-free lead acid					
	Typical Recharge Time	4 hours (to 90% of full capacity)					

	Protection	Automatic self-test & discharge protection, Replace battery indicator					
	Back - up Time	10 - 30 minutes (depending on computer load)					
PHYSICAL	Net Weight Kg(lbs)	13.8 (30.4)	14.5 (31.9)	15 (33.0)	15.8 (34.8)	25 (55.0)	30 (66.0)
	Shipping Weight Kg(lbs)	14.8 (32.6)	15.5 (34.1)	16 (35.2)	16.8 (37.0)	27 (59.4)	32 (70.4)
	Dimension(mm) WxDxH	140x445x200		140x445x200		170x450x215	
	Input Inlet	IEC 320 power inlet					
	Receptacles	NEMA 5-15R (115V)/IEC 320 female appliance coupler (230V)					
ALARM	Battery Back-Up	Slow beeping sound (about 0.25Hz)					
	Battery Low	Rapid beeping sound (about 1.00Hz)					
	Overload	Continue beeping sound					
INTERFACE	RS-232	Bi-directional communication port					
CONFORMANCE	Safety	cUL, TUV, CE, meet FCC					
	Surge	Meet IEEE 587 standard					
	Warranty	Two years					
ENVIRONMENT	Ambient operation	6,000 meters max. elevation, 0-95% humidity non-condensing 0-40 deg C					
	Audible noise	<40dBA (1 meter from surface) | <45dBA (1 meter from surface)					
	Storage condition	15000 meters max. elevation					

14. Specifications

MODEL		SMK	SMK	SMK	SMK	SMK	SMK
		800A RM	1250A RM	1500A RM	2000A RM	2500A RM	3000A RM
INPUT	Capacity	800VA	1250VA	1500VA	2000VA	2500VA	3000VA
	Voltage	+/-25% at line input , Single phase					
	Frequency	50 or 60Hz +/-5% (auto sensing)					
OUTPUT	Voltage (on battery)	Pure sine wave output at +/-5% of nominal, -10% after low battery warning					
	Frequency (on battery)	50 or 60Hz +/-0.5%					
	Voltage Regulation AVR	AVR automatically increase output voltage 15% above input voltage if -9% to-25% of nominal. AVR decrease output voltage 15% below input voltage if+9% to +25% of nominal					
PROTECTION AND FILTERING	Spike Protection	320 Joules, 2ms					
	Unit Input	Fuse for overload & short circuit protection					
	EMI/RFI filter	10dB at 0.15MHz, 50dB at 30MHz					
	Overload Protection	UPS automatic shutdown if overload exceeds 110% of nominal at 20 second and 125% at 2 seconds.					
	Transfer Time	2/4 milliseconds, including detection time					
	Short Circuit	UPS output cut off immediately or input fuse / breaker protection					
BATTERY	Type	Hot swappable, Sealed, Maintenance-free lead acid , with 3-6 years lifetime					
	Typical Recharge Time	4 hours (to 90% of full capacity)					

	Protection	Automatic self-test & discharge protection, Replace battery indicator					
	Back - up Time	10 - 30 minutes (depending on computer load)					
PHYSICAL	Net Weight Kg(lbs)	18.0 (39.6)	23.5 (51.7)	26.1 (57.4)	28.4 (62.4)	55.2 (121.4)	57.8 (127.1)
	Shipping Weight Kg(lbs)	19.5 (42.9)	25.0 (55.0)	27.7 (60.9)	30.0 (66.0)	58.0 (127.6)	60.0 (132.0)
	Dimension(mm) WxDxH	483 x 381 x 130				483 x 508 x 221	
	Input Inlet	IEC 320 power inlet					
	Receptacles	NEMA 5-15R (115V)/IEC 320 female appliance coupler (230V)					
ALARM	Battery Back-Up	Slow beeping sound (about 0.25Hz)					
	Battery Low	Rapid beeping sound (about 1.00Hz)					
	Overload	Continue beeping sound					
INTERFACE	Support both RS232 &dry contact signal	Provide power management & diagnostic functions including power status, battery low, schedule UPS ON/OFF, battery/load level display and more. Compatible with Windows 95/98/NT, Novell, Unix and other popular systems.					
ENVIRONMENT	Ambient operation	3,500 meters max. elevation, 0-95% humidity non-condensing 0-40 deg C					
	Audible noise	<40dBA (1 meter from surface)	<45dBA (1 meter from surface)				
	Storage condition	15000 meters max. elevation					

14. Specifications

MODEL		SMK 2500A	SMK 3000A	SMK 1000AL	SMK 2000AL	SMK 3000AL
INPUT	Capacity	2500VA	3000VA	1000VA	2000VA	3000VA
	Voltage	+/-25% at line input, Single phase				
	Frequency	50 or 60Hz +/-5% (auto sensing)				
OUTPUT	Voltage (on battery)	Pure sine wave at +/-5% of nominal, -10% after low battery warning				
	Frequency (on battery)	50 or 60Hz +/-0.5%				
	Voltage Regulation AVR	AVR automatically increase output voltage 15% above input voltage if -9% to-25% of nominal. AVR decrease output voltage 15% below input voltage if+9% to +25% of nominal				
PROTECTION AND FILTERING	Surge Protection	320 Joules, 2ms				
	Unit Input	Breaker for overload & short circuit protection				
	EMI/RFI filter	10dB at 0.15MHz, 50dB at 30MHz				
	Overload Protection	UPS automatic shutdown if overload exceeds 110% of nominal at 20 second and 125% at 2 seconds.				
	Transfer Time	2/4 milliseconds, including detection time				
	Short Circuit	UPS output cut off immediately or input fuse protection				
BATTERY	Type	Hot swappable, Sealed, Maintenance-free lead acid ,with 3-6 years life time				
	Typical Recharge Time	4 hours (to 90% of full capacity)				

	Nominal Battery Voltage	48V	48V		24V	48V	
	Built-in Charge Current	2A	2A		4A	4A	
	Supplied Battery Packs	Built-in	External pack		Depend on request		
	Protection	Automatic self-test & discharge protection, Replace battery indicator					
	Back - up Time	10 - 30 minutes (depending on computer load)					
PHYSICAL	Net Weight (Kg)	(220V)30	(110V) 20.2	(220V) 21	(220V)10	19	(220V) 26.8
	Shipping Weight (Kg)	32	22.7	21	11	21	29.3
	Dimension(mm) WxDxH	170x445 x200	(110V) 170x580x215		140x445 x200	170x450 x215	170x580 x215
ALARM	Battery Back-Up	Slow beeping sound (about 0.25Hz)					
	Battery Low	Rapid beeping sound (about 1.00Hz)					
	Overload	Continue beeping sound					
INTERFACE	RS-232 Interface	Bi-directional communication port					
CONFORMANCE	Safety	cUL, TUV, CE, FCC					
	Surge	Meet IEEE 587 standard					
	Warranty	Two years, including battery					
ENVIRONMENT	Ambient operation	6,000 meters max. elevation, 0-95% humidity non-condensing 0-40 deg C					
	Audible noise	<40dBA	<50 dBA (1 meter from surface)				
	Storage condition	15000 meters max. elevation					